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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/702,322	10/31/2000	Vincenzo Antonucci	267.153-DIV	9779

20311 7590 02/26/2003

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EXAMINER

TRAN, THAO T

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 02/26/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/702,322

Applicant(s)

ANTONUCCI ET AL.

Examiner

Thao T. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-16, 18-23, 25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-16, 18-23, 25 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This is in response to the Amendment received on December 02, 2002. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.
2. Claims 16, 18-23, and 25-26 are currently pending in the application. Claims 17 and 24 have been canceled.

### ***Claim Objections***

3. In view of the prior Office Action of July 10, 2002, the objection of claim 12 has been withdrawn due to the Amendments made thereto.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 12-26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 12-26 are rejected as containing new matter because claim 12 contains the limitation of "heating the membrane to a temperature at least about 5°C above its said operating temperature" and claim 24 the limitations of "the treatment temperature is at least 5°C above the

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glass transition temperature of the membrane" and "the operating temperature is at least 5°C below the glass transition temperature of the membrane". These limitations have no support in the original presentation of the parent application 09/206,849, and thus, they are considered new matter.

*Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 12-16, 20, and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimoda (US Pat. 6,017,455).

In regards to claim 12, Shimoda teaches a heat treatment process for a sulfonated polymeric membrane that is substantially amorphous prior to the heat treatment, the purpose of the heat treatment being to increase the degree of crystallinity of the membrane just as required in the claimed invention (see col. 12, ln. 56-67; col. 25, ln. 64 to col. 26, ln. 6).

In Example 1, Shimoda teaches a heat treatment of a polymeric proton exchange membrane (sulfonated polymeric membrane, which has an ion-exchange capacity of 0-0.5 meq/g) (see col. 12, ln. 56-61), wherein the membrane is immersed in a 60°C solvent for 2 hours and further in a 200°C solvent for 2 hours, and the crystallinity in the membrane increases from less than 10% to 26% by weight (see col. 36, ln. 5-17). Since the heat treatment takes place at 200°C (elevated temperature), the intended operating temperatures would be inherently above 100°C.

Shimoda further teaches the membrane being washed at room temperature (ambient temperature) after the heat treatment (see col. 32, ln. 55 to col. 33, ln. 4).

In regards to claims 13-15, Shimoda teaches the use of the membrane at a temperature of 150°C and 180°C (intended operating temperatures) (see col. 36, ln. 28; col. 37, ln. 62-64), which are respectively below and above the glass transition temperature of the membrane ( $T_g = 151^\circ\text{C}$ ) (see col. 35, ln. 50-51) and are more than 130°C.

In regards to claim 16, Shimoda teaches the percentage of crystallinity being determined using X-ray spectroscopy (see col. 35, ln. 12-13).

In regards to claim 20, the arguments are as presented in claim 12. With respect to the use of the membrane, it has been held within the skill in the art that function or intended use would play little patentable weight when a structure is being considered for its patentability. See *In re Danly*, 120 USPQ 528, 531 (CCPA 1959); *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In regards to claim 22, the arguments are as presented in claim 15.

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In regards to claim 23, Shimoda teaches the heat treatment temperature being 200°C and the operating temperature being 150°C (see Example 1) whereas the glass transition temperature of the membrane ( $T_g$ ) being 151°C (see col. 35, ln. 50-51).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 18-19, 21, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoda as applied to claim 12 above, and further in view of Murphy et al. (US Pat. 6,059,943).

Shimoda is as set forth in claim 12 above and incorporated herein.

In regards to claims 18-19, although Shimoda teaches the membrane wherein the polymer comprising a hydrocarbon bearing sulfate group (sulfonated polymeric membrane), the reference does not teach the polymer comprising fluorine, or specifically perfluorocarboxylic acid polymer.

In regards to claims 21 and 25-26, Shimoda does not teach the use of the membrane in a fuel cell that contains carbon monoxide or that hydrogen is applied to the anode and oxygen-containing gas to the cathode.

Murphy teaches a method for conditioning a polymeric proton exchange membrane for operation at temperatures above 100°C, wherein the membrane polymer is perfluorosulfonic

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polymer (see col. 6, ln. 64 to col. 7, ln. 5; col. 8, ln. 37-44; col. 9, ln. 61-63). Murphy further teaches the membrane is placed between two electrodes; wherein hydrogen is applied to the anode and air to the cathode (see col. 13, ln. 65 to col. 14, ln. 6).

Although Murphy does not teach the concentration of carbon monoxide to be specifically 1%, Murphy does teach the membrane for use in fuel cells that may contain carbon monoxide, thus embracing the instantly claimed invention.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have substituted the membrane, as taught by Murphy for the one of Shimoda, because Murphy teaches that the membrane bearing perfluorosulfonic polymer would have high melting point, and hence, would be suitable for use in fuel cells that operate at high temperatures (above 150°C) and contain carbon monoxide (see col. 8, ln. 37-44).

### *Response to Arguments*

10. Applicant's arguments filed on December 02, 2002 have been fully considered but they are not found persuasive.

In response to Applicant's arguments that Shimoda's membrane is not a membrane for use in a fuel cell because the membrane is porous; whereas the membranes for fuel cells are rather solid non-porous membranes. However, the claim language does not include whether applicant's membrane is solid or otherwise, or that the membrane is used in a fuel cell. Thus, Shimoda teaches all the limitations recited in the presently claimed invention.

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It is hereby noted that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

11. In response to applicant's argument that Shimoda is nonanalogous art and therefore cannot be used in combination with Murphy, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, since the claim language does not include whether the membrane is solid or otherwise, or that it is for use in a fuel cell, Shimoda teaches the recited limitations in the instant claims and Murphy is used to illustrate that perfluorosulfonic polymer has been taught in the prior art and that it can be used in an electrochemical device.

### *Conclusion*

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37



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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao T. Tran whose telephone number is 703-306-5698. The examiner can normally be reached on Monday-Friday, from 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 703-308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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February 23, 2003



James J. Seidleck  
Supervisory Patent Examiner  
Technology Center 1700